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#### USSR PLANTS INCREASE OUTPUT OF MACHINES FOR ANIMAL HUSBANDRY

This report consists of an editorial and an article from the periodical Sel'khoz Mashina discussing achievements in the mechanization of Soviet animal husbandry in connection with the 3-year plan (1949 - 1951) for developing communal, kolkhoz, and sovkhoz animal husbandry.

#### ACHIEVEMENTS AND GOALS IN THE MECHANIZATION OF ANIMAL HUSBANDRY

The decree of the TsK VKP(b) and the Council of Ministers USSR of 18 April 1949, "On the Three-Year Plan for Developing Communal Kolkhoz, and Sovkhoz Productive Animal Husbandry," represents a milestone in the restoration and development of agriculture.

The decree of the TsK VKP(b) of 21 April 1949 set forth specific measures for raising the level of mechanization of labor-consuming tasks on animal husbandry farms and kolkhozes.

The design bureaus of the Lyubertsy Agricultural Machine Building Plant imeni Ukhtomskiy, the Gomsel'mash Plant, the Uralsel'mash Plant, the Sibselsel'mash Plant, and VISKHOM (All-Union Institute of Agricultural Machine Building) have, in 2 years, developed and prepared for series production such new machines as silage combines, mobile fodder steaming machines, a rotary tiller for revitalizing meadows and pastures, a well-digging machine, a horse gear in an oil bath for farm water supply, a towerless water supply apparatus, ground and overhead conveyers for intrafarm conveyance, and many others. In 1951, the Design Bureau of the Lyubertsy Agricultural Machine Building Plant imeni Ukhtomskiy developed designs for crane and elevator hay stackers, a three-bar suspension mower to be used with the U-2 tractor, a suspension side and front mower for the KhTZ-7 tractor, and a hay stacker and sweep rake for the KhTZ-7 tractor; the Design Bureau of the Gomsel'mash Plant developed designs for and built models of manure loaders and manure spreaders for the KD-35, U-2, and KhTZ-7 tractors, ensilage-compressing and ensilage-unloading machines, fodder-processing machines for hog farms, mobile milking machines, and others; VISKHOM developed a design for a roller press-pickup.

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In 1952, the designing of these machines should be completed on the basis of tests made with models in 1951, and the machines should be prepared for production.

In spite of the considerable volume of work done in 1949 by plant design bureaus and the design bureau of VISKhom, the tempo of work in designing, developing, and organizing the production of these machines is plainly inadequate and lags behind the demands and rate of development of animal husbandry. The work of the design bureaus of VISKhom and of the Lyubertskiy Agricultural Machine Building Plant imeni Ukhtomskiy in the construction of highly productive motor hay stackers has been dragging along intolerably, and models of tractor, crane, and elevator hay stackers built by these organizations are inefficient and not sufficiently productive. Construction of models of refrigerating units, manure loaders, manure spreaders, ensilage compressors and ensilage unloaders, mobile pump outfits for winter pastures, and other machines is lagging.

There are also delays in organizing the series production of new machines. At the Uralsel'mash Plant, technological processes in the production of parts and the assembly of press-pickups have not been organized efficiently, and, as a result, some of these machines do not fully meet operating requirements. Control testing of roller mowers made by the Rostsel'mash Plant revealed serious defects in their design.

Scientific workers of VISKhom, and designers and technologists of plant design bureaus are faced with the enormous task of building and organizing the production of highly productive and fully reliable machines for mechanizing all types of work in animal husbandry.

In the next few years, models of new, considerably more productive machines for the complex mechanization of work in the communal animal husbandry of consolidated kolkhozes and animal husbandry sovkhozes must be designed. Wide-swath mowers and side rakes, press-pickups, bale loaders, and hay stackers for operation with powerful caterpillar tractors must be built. A number of new machines and attachments must be built for ancillary tasks, e.g., mechanized grindstones for sharpening the blades of wide-swath mowers, machines for processing albumin-vitamin fodder for young cattle, machines for washing and cleaning animals, and other machines.

Special attention should be devoted to building wind-driven generators and equipment for supplying water to isolated pastures and animal husbandry farms.

#### PRODUCTION OF MACHINES FOR MECHANIZING ANIMAL HUSBANDRY WORK, 1949 - 1951

Engr A. V. Chumayevskiy  
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In the decree of 18 April 1949, the Council of Ministers USSR and the TsK VPK(b) set forth a 3-year plan for developing communal, kolkhoz, and sovkhoz animal husbandry.

The plan ascribed a major role to mechanizing the cultivation and processing of fodder, and also to the mechanization of work on kolkhoz and sovkhoz livestock farms.

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The Council of Ministers USSR and the TsK VKP(b) noted that the output of industrial equipment and machines for mechanizing labor-consuming tasks in animal husbandry and fodder procurement was badly lagging behind the needs of kolkhoz and sovkhos animal husbandry.

Subsequent decrees of the Council of Ministers in April 1949 established a complex of equipment for hay harvesting, ensilage storing, meadow improvement work, irrigating, and preparing seasonal pastures, to be used by Machine and Tractor, Mechanized Land Improvement, and Mechanized Animal Husbandry stations.

The 3-year plan assigned to the Ministry of Agricultural Machine Building set the following goals: to produce 46,000 tractor mowers in 1951 as compared with 1,138 in 1948; to produce 16,000 tractor rakes in 1951 as compared with 900 in 1948; and to produce 10,000 silo cutters in 1951 as compared with 3,000 in 1948.

The results attained by the Ministry of Agricultural Machine Building in producing machines for animal husbandry may be characterized in the following way. Taking the average 1940 monthly output of hay-harvesting, fodder-processing, and animal husbandry farm machines as the unit basis, expressed in price valuation, the 1949 output, in comparable prices, was 4.6 times as great; the 1950 output, 7.7 times; and the 1951 output 8.5 times as great.

The range of types of machinery produced has widened considerably: whereas 12 types (marka [literally, brand]) were produced in 1940, 34 types were produced in 1949, and 49 in 1950. The increase in the number of type designations in this period may be attributed to the development and production of highly productive tractor machines, including tractor, self-propelled, and roller hay harvesters, tractor side rakes, tractor sweep rakes, tractor press-pickups, pickup-stackers, mechanical baling presses, motor straw silo cutters, and other machines. Since the prewar output of machines for animal husbandry has been so far surpassed that it cannot serve as a yardstick, further comparisons will be made with 1949, the year in which the 3-year plan came out.

By the beginning of the fourth quarter 1951, the output of machines for animal husbandry had increased 1.85 times as compared with 1949. In this period, the output of tractor mowers increased 4 times; output of self-propelled hay mowers, 5 times; tractor rakes, 5 times; tractor sweep rakes, 1.85 times; motor baling presses, 5 times; motor and tractor silo cutters, 7.3 times; universal mills, 4.5 times; fodder steamers, 7.4 times; and automatic water troughs, 16 times.

The scale of production of hay-harvesting and fodder-processing machines may be judged from the fact that, according to the plan for the fourth quarter 1951, agricultural machine building plants were to achieve the following average daily output: 340 tractor mowers, 25 self-propelled mowers, 335 horse mowers, 73 tractor rakes, 59 tractor and motor silo cutters (productivity 12 and 6 tons per hour), 20 universal fodder grinders, 50 fodder steamers, 1,000 automatic water troughs, and 470 milk separators.

The most important achievement of the agricultural machine building plants in the last 3 years has been the development of sufficient capacity to enable them to increase their output so markedly.

Many of the plants have changed their character radically. One of the plants formerly produced only [horse] gears and semicomplex threshers; hence, working and simple gray iron casting were the main processes at the plant. Now the plant puts out complex tractor press-pickups with double binding apparatus, and mechanical baling presses. The production of these machines necessitated the construction of two large machine shops along with equipment and

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operating personnel. In the foundry, a malleable iron department making complex parts for binders and steel castings for the production of baling press parts has been set up along side the gray iron casting conveyor. The capacity and the quality of work of the tool shop, the heat treating department, and other departments have changed considerably. The organization of labor in the assembly, painting, and finishing of machines is also being changed, although the rate of change is slower than it should be.

The example of another plant is also characteristic. In the prewar period, the chief products of the plant were sorters and semicomplex threshers; therefore, the woodworking shop and the gray iron foundry were of prime importance. Now the plant produces various complex agricultural machines, including such large-series machines as medium power motor silo cutters, a combine for silage crops, and ensilage throwers (experimental series). This has brought about a marked change in the structure and organization of shops and in the makeup of the plant's equipment. Taking the prewar quantity of metal-cutting and press-forging equipment as a basis there were in operation on 1 July 1951, 1.83 times as many metal-cutting machine tools and 2.4 times as much press-forging equipment, including universal and special machine tools, and large-size press and hammer equipment which the plant did not possess in the prewar period. The tool shop was altered to conform to these other changes. The foundry was equipped with two conveyers and a new charge mixing department. A new assembly-painting building fitted with special equipment has been opened; it will have conveyers in the future.

One of the main problems that had to be solved at the plants to increase production to plan was to increase the capacity of the foundries, especially in the malleable iron and press-forging shops, not only by mechanizing existing shops, but also by building new ones.

Now, all the main plants producing hay-harvesting, fodder-processing, and other machines for animal husbandry have conveyor-equipped foundries. The level of mechanization of foundry work may be illustrated by the example of the Main Administration of Harvesting Machines, which produces a great number of hay-harvesting machines and more than 50 percent of all the fodder-processing machines. In the first half of 1951, machine molding was used for 92 percent of the general yearly output of castings, shake-out of castings was 71 percent mechanized, and the cleaning of castings was 90 percent mechanized.

Implementing these measures at animal husbandry machinery plants made it possible to double the output of malleable iron (which formerly limited the output of hay-harvesting and other machines) in 1951, as compared with 1948, and to increase the output of forgings and hot stampings 1.9 times as compared with 1948. In the same period, more than 3,600 types of dies were put to use in the press-forging shops of animal husbandry machinery plants.

Along with the growth in capacity of the casting and forging shops of the main machine building plants, there was cooperation among the plants of the Ministry of Agricultural Machine Building in the supply of castings, for the most part malleable iron castings and stampings. For example, the production of the K-6 tractor mower was organized on the basis of broad cooperation.

The increase in the capacity of plant machine shops was attained by providing additional accessories for the existing machine tool park, bringing the equipment in the plants up to the projected amount, and also by using special and combination tools, setting up constant-flow lines, and organizing closed single item sections in the machine shops. For description of the constant-flow method,

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More than 4,800 different type designations of attachments for machining parts for hay-harvesting and fodder-processing machines were prepared in the course of 2 years (according to incomplete data). Along with the growth in capacity of the main plants in the production of attachments, dies, measuring tools, and cutting tools, there was also broad cooperation among the plants of the ministry in making accessories.

Mowers, tractor rakes, self-propelled mowers, and press-pickups were built out by cooperation.

In a period of 2 years, about 140 units of new special and combination equipment, including 55 machine tools for machining tractor and horse mower parts, 47 machine tools for machining parts for self-propelled mowers, and 7 machine tools for machining mass-produced parts for tractor and horse rakes, were adopted in the production of machines for animal husbandry.

Much has been done to improve the organization of assembly operations, and also to remodel painting-drying equipment to take into account the application of two coats of paint over the primer coat. The assembly of animal husbandry machine units is chiefly carried out on constant-flow lines. For example, at the Lyubertsy Agricultural Machine Building Plant imeni Ukhtomskiy there are more than five constant-flow lines, and a painting-drying conveyor used in the production of hay mowers; at the Pervomaysk Agricultural Machine Building Plant, five constant-flow lines have been organized for making units of tractor rakes; at the Rostsel'mash Plant, assembly and painting-crating conveyers have been built for the production of self-propelled hay mowers, and the constant-flow assembly of roller mowers has been organized.

Constant-flow lines for the assembly of units and machines for animal husbandry have also been organized at the Gomsel'mash, Kurgansel'mash, Ural'sel'mash, L'vovsel'mash, and other plants.

The capacity of plant welding sections has been greatly increased, chiefly by organizing welding on the constant-flow method and adopting automatic welding under a layer of flux. For example, automatic welding of small units of the KS-10 self-propelled mower has been adopted at the Rostsel'mash Plant, increasing labor productivity several times; and the welding of self-propelled combine frames has been organized by the constant-flow method.

Another example is that of the L'vovsel'mash Plant, which was faced with the problem of organizing the large-series production of fodder steamers, but had a severe shortage of production space. The problem was to increase the output of fodder steamers from 2,000 (in 1948) in the whole Ministry of Agricultural Machine Building to 11,000 at the L'vovsel'mash Plant alone.

The plant solved this problem with the aid of the Institute of Electric Welding, Academy of Sciences Ukrainian SSR, and of the Ministry of Agricultural Machine Building. Rapid automatic welding under a layer of flux was adopted, welding processes were mechanized, and constant-flow lines were built. The ADS-1000 automatic welding machine on a special stand is used for welding the lengthwise seams of fodder steamer boilers.

The PSh-5 semiautomatic welder (mounted on a special stand) designed by the Institute of Electric Welding, Academy of Sciences Ukrainian SSR, is used for welding circular seams, separate units, and also the firebox of the fodder steamer.

As a result of mechanization, improved technology, and the adoption of conveyor and constant flow methods of production, the labor consumption of machines produced was sharply reduced.

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Taking the labor consumption of a particular machine in 1948 (or at the time its production started) as 100 percent, the changes in this qualitative index for 1949, 1950, and the first half of 1951 may be seen in the table below.

In spite of the growth in the production of machines for animal husbandry, workers of the agricultural machine building industry cannot slacken their efforts, since the quantity of machines decreed by the Council of Ministers USSR and the TeK VKP(b) for the 3-year plan was not produced in 1950 - 1951 in the case of a number of machines e.g., tractor cross and side rakes, and self-propelled mowers

A number of plants producing machines for animal husbandry are lagging in plan fulfillment, e.g., the Frunze Agricultural Machine Building Plant imeni Frunze, the Kazakhsel'mash Plant, and the Pervomaysk Agricultural Machine Building Plant.

There are serious shortcomings in the organization of production and technology at the plants. Even at a large and progressive enterprise like the Rostsel'mash Plant, constant-flow lines and closed [single] item sections for machining and assembling parts and units of self-propelled mowers have not been worked out efficiently.

The 1952 plan provides for a further increase in the output of tractor machines (tractor mowers, rakes, and sweep rakes). The series production of silage combines, ensilage throwers, and well-digging machines should be organized anew.

In 1952, engineering-technical workers of plants producing machines for animal husbandry should denote the major part of their attention to improving the technology and organization of production to achieve a further improvement in quality and a lowering of the production cost and labor consumption of the machines they produce.

#### Labor Consumption of Animal Husbandry Machines (Percent)

This table summarizes information from 12 graphs. Percentages are taken from line graphs, and hence are approximate.

<u>Machine</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>First Half 1951</u>
1. KT-6 tractor mower	100	70	52	42
2. KP-2.1 tractor mower		100	72	62
3. GPT-14.5 tractor rake	100	60	40	30
4. KS-10 self-propelled mower		100	80	63
5. VN-3.0 tractor sweep rake		100	70	50
6. PVT-1.0 tractor sweep rake		100	72	68
7. PSM-5.0 mechanical baling press			100	70

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<u>Machine</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>First Half</u> <u>1951</u>
8. Dzerzhinets separator	100	82	81	70
9. IK-3 fodder grinder			100	72
10. DA-3 milking aggregate	100	60	49	32
11. EK-0.2 fodder steamer			100	70
12. EK-1.0 steaming aggregate			100	62

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